It is to be remembered that the nearer the fluid to the state of saturation, the more readily does it surrender heat.

In the indicator-diagram it is often observed that there exists a point of inflexion at the summit of the compression-curve. This has been, by earlier authorities, generally ascribed to leakage past the piston on attaining a certain limiting pressure at which the piston-rings yield. Later observers have suspected and the writer has long believed that this peculiar inflexion may mark a point at which the surrender of heat of compression to the metal of the cylinder-wall occurs so rapidly, as a consequence of the increasing temperature-head, as to cause more rapid condensation than can be counteracted in its effect upon pressure by the constantly diminishing rate of compression. This phenomenon, in such case, is an indication, if not a measure, of the heat-exchange thus taking place. M. Duchesne finds confirmation in his own experiments of this later idea, and of the propositions which he has advanced, as well as of the accuracy of the work of M. Dwelshauvers-Dery.

R. H. Thurston.

Cornell University.

SCIENTIFIC NOTES AND NEWS.

The National Academy of Sciences will hold its annual fall meeting at Columbia University, New York, from November 14th to 17th.

Professor Dean C. Worcester, of the University of Michigan, has returned to the United States, to report to the President as one of the members of the Philippine Commission.

Professor George T. Ladd, of Yale University, who is at present in Japan, has received from the Japanese Emperor, the third-class decoration of the Order of the Rising Sun.

Dr. Eugene A. Darling has been appointed bacteriologist of the Cambridge Board of Health, to succeed Dr. George B. Henshaw.

Mr. W. H. Twelvetrees, F.G.S., has recently been appointed to the position of geologist to the Government of Tasmania.

Dr. Alfred Jentzsch, docent at Königsberg, has been appointed geologist of the Government Survey in Berlin.

Dr. Otto Lubarsch, associate professor at Rostock, has been made director of the pathological and anatomical division of the newly established State Institute of Hygiene at Posen.

Mr. J. E. Duerdin, curator of the Kingston Museum, Jamaica, is this year studying at the Johns Hopkins University.

Mr. W. H. M. Christie, C.B., the Astronomer Royal has been elected one of the Wardens of the Clockmakers' Company.

Dr. Louis L. Seaman offers, through the Military Service Institution of the United States, a prize of $100 for the best essay on 'The Ideal Ration for an Army in the Tropics.' Papers should be received before March 1, 1900.

Mr. Hamilton Y. Castner, died at Saranac Lake, N. Y., on October 10th, aged 41 years. Mr. Castner made important advances in industrial chemistry, especially in the manufacture of aluminium and in the electrolytic processes of manufacturing caustic soda and chlorine from cloride of sodium.

The death is announced at Obersdorf of Dr. Ernst Rosenberger, known for his writings on the history of physics.

Dr. Karl Russ, the ornithologist, died at Berlin on September 29th, aged 66 years.

It has been proposed to place a bust and an enlarged photograph of the late Dr. Friedel in the hall of the Sorbonne. The estimated cost of the bust, which will be the work of M. Uitain, is 3,000 francs. An appeal for subscriptions has been issued. These should be sent to M. Chason, at the Laboratory of Organic Chemistry, Faculty of Science, the Sorbonne.

At the ceremonies attending the unveiling of the monument of Johannes Müller at his birthplace, Coblentz, on October 2d, Professor Virchow was the principal speaker. The British *Medical Journal* states that in the course of his address Professor Virchow referred to the difficulty that had been found in choosing an appropriate inscription. The simple one chosen by the sculptor: 'To the great anatomist and physiologist,' would perhaps hardly satisfy all concerned. Strictly speaking, Johannes Müller was a biologist, a naturalist whose aim

was the study of life itself in its universality. He was the first to use the microscope in researches on living beings; he was the first to disclose to us the fauna of the seas. His example inspired the deep-sea researches of our own day, of which the German scientific station in Naples formed a center. Professor Koester, Rector of Bonn University, speaking as the representative of the Monument Committee, handed over its charge to the mayor and municipality of Coblentz. Professor Waldeyer, Rector of the Berlin University, made the closing speech as the delegate both of the Berlin University, where Müller's chief teaching years were spent, and of the Prussian Academy of Sciences. In these two institutions, said Waldeyer, Johannes Müller had raised a monument to himself that no time could destroy.

THE Seventeenth Congress of the American Ornithologists' Union will convene in Philadelphia, at the Academy of Natural Sciences, 19th and Race Sts. (Logan Square), on Monday, November 13th, at 8 o'clock p. m. The evening session will be for the election of officers and members and the transaction of other routine business. The meetings open to the public, and devoted to the reading and discussion of scientific papers, will be held in the Lecture Hall of the Academy, beginning Tuesday, November 14th at 11 a. m., and continuing for three days. Information regarding the Congress can be had by addressing the Secretary, Mr. John H. Sage, Portland, Conn.

A TELEGRAM has been received at the Harvard College Observatory from Professor J. E. Keeler, at Lick Observatory, stating that the following elements and ephemeris of Comet *e*, 1899, were computed by Perrine from observations on October 1, 7, 16:

Time of passing perihelion	$=T=$	Sept. 15.04 G. M. T.
Perihelion minus node	$=\omega=$	10° 52′
Longitude of node	$=N=$	272° 13′
Declination	$=i=$	76° 55′
Perihelion distance	$=q=$	1.7854

EPHEMERIS.

1899. Oct. 24,	R.A. $17^h\ 5^m\ 8^s$.	Dec.	+2° 17.′	Light	0.72
" " 28,	" 17 11 12.	"	+3 21.		
" Nov. 1,	" 17 17 24.	"	+4 25.		
" " 5,	" 17 23 36.	"	+5 29.	"	0.63

THE American Museum of Natural History, New York, will hereafter be opened free to visitors on Wednesdays, Thursdays, Fridays and Saturdays, on Sunday afternoons and on Tuesday and Saturday evenings. The free lectures given under the auspices of the Board of Education are on Tuesday evenings and the lectures by Professor A. S. Bickmore to teachers in the public schools are on Saturday mornings.

THE London correspondent of the New York *Evening Post* states that two expeditions will soon take the field in South America. Professor Zittel, of Munich, is arranging to send a scientific expedition to Patagonia, and it is very probable that a similar undertaking will be organized in London on very comprehensive lines, the Argentine Government having promised to render aid and grant all facilities to a British expedition under responsible or official control.

Nature, quoting from the *Civil and Military Gazette*, Lahore, states that the Indian Government has under its consideration a somewhat comprehensive scheme for the establishment of research laboratories in various parts of India, and the appointment of health officers to take charge of them. The present laboratory at Muktesar will, it is understood, be further developed and the staff increased, the establishment becoming the central research laboratory for India, and health officers will be appointed to the charge of laboratories at Calcutta, Madras, Bombay, Agra and Lahore, the new department of bacteriology being ordinarily manned by officers of the Indian Medical Service.

THERE has been an active and somewhat acrimonious discussion in the English journals in regard to the extent to which physicians receive commissions. It is said that in the United States physicians do not receive commissions from pharmacists to any considerable extent, but suit has just been brought by a San Francisco physician for $300, which he claimed as a commission on prescriptions sent to a druggist. Complaint is also made that some of the younger surgeons in New York ophthalmic hospitals receive commissions from opticians.

A MEETING of the Society of Engineers was held at the Royal United Service Institution,

Whitehall, on October 2d, Mr. John C. Fell (President), in the chair. According to the account in the London *Times*, a paper was read by Mr. J. Bridges Lee on 'Photographic Surveying.' The author set out in detail the special advantages of the photographic method. Among these advantages are: (1) A more complete and accurate record than can be obtained by any other means; (2) saving of time in the field; (3) ability to take full advantage of short clear interludes in unsettled weather; (4) special advantages for military purposes in an enemy's country; (5) utility for travelers rapidly traversing a country; (6) usefulness for detecting geological and physiographical changes; (7) economy in operation. The author then passed in review the various kinds of photo-topographic apparatus which had beeen designed and constructed, pointing out the distinctive features of most of the best known instruments. All the best photographic survey work everywhere had been done with plane projection instruments. The author described the improvements made by him, designed to facilitate the subsequent interpretation of the photographs. These improvements consist of certain mechanical appliances inside the camera for securing an automatic record on the face of every picture taken of the horizon and principal vertical lines, of the compass bearing of the optic axis or principal plane, of a scale of horizontal angles applicable to all points visible in the picture, and of memoranda of useful information relating to the particular picture.

Reuter's Agency reports that Dr. Carl Peters, the explorer, left Portuguese territory at the beginning of August, and crossed into Mashonaland, taking with him two of his prospectors, Messrs. Blocker and Gramann. The rest of his expedition he left in the neighborhood of the ancient ruins re-discovered by him near the Zambesi. He expresses his intention of establishing a permanent station on the Inyanga Highlands, and from that point of exploring the whole of Mashonaland from north to south. Besides gold, Dr. Peters claims to have discovered mica, saltpeter, and diamonds in a district practically uninhabited at an altitude of 8,000 feet, and, he believes, easily capable of cultivation. As the rainy season is now setting in Dr. Peters will, after exploring some districts on the Pungwe River, proceed to Beira *en route* for England.

At a special meeting of the American Forestry Association at Columbus, in connection with the meeting of the American Association, resolutions were adopted recommending:

1. The creation of an international commission, through M. Meline, of Paris, to arrange for a Congress of Forestry at the Paris Exposition of 1900.

2. The purchase and reservation, by the State of Ohio, of tracts of timber land at the headwaters of the principal rivers of the State in order to prevent the increasing loss of life and property by flood, and for the better preservation of a water supply in time of drought.

3. The establishment of colleges and schools of forestry in the various States, with as much assistance as possible, in encouragement of the work, from the Department of Agriculture.

4. Commending the policy adopted by the State of Pennsylvania in the appointment of an expert forester to organize and conduct the forest interests of the State, and to educate its citizens in practical forestry.

5. Urging the suitable presentation of the subject of forestry at the meetings of teachers' associations, farmers' institutes, and other similar gatherings, "to the end that the people may be taught to give earnest attention to this much-neglected, but vitally important interest."

The Vienna correspondent of the London *Times* writes that the trials of the system of rapid telegraphy invented by two Hungarians, MM. Pollak and Virag, which took place between Budapest and Berlin at midnight on September 29th, are represented to have practically justified the claims made on behalf of the new process. The experiments were conducted at both ends under the personal direction of the inventors in the presence of experts, including representatives of the Hungarian and French governments and one of the American cable companies. These are alleged to have given the extraordinary result of a transmission of no fewer than 220 words in ten seconds without prejudicing the clearness of the message. A perforated roll of paper, similar to that at present in use, is employed for the dispatch of the message, which is made visible and fixed photographically at the receiving station. Instead

of the dashes and dots of the Morse alphabet, there are rising and falling strokes starting from a horizontal line. The receiver consists of a telephone fitted with a small concave mirror, upon which are reflected, in the form of streaks of light, the impulses marked on the membrane. By an ingenious arrangement, recalling in some respects that of the cinematograph, the streaks of light reflected upon the mirror are reproduced upon a roll of sensitized paper, thus giving a narrow oblong picture, which in the present stage of the invention is developed and fixed like any ordinary photograph.

WE learn from the *Electrical World* that a singular decision has been made in the Senate of the Supreme Court of the Empire of Germany. Last December three mechanics attached a wire to a cable laid in the house where they lodged, and stole electricity enough to light their rooms. The Provincial Court sentenced them each to one day's imprisonment. The decision was based on the principle that electricity possessed the essential properties of a movable object. It has gone from court to court, and now the Senate holds that the judgment of the Provincial Court must be quashed on the grounds that the law provides only against the theft of movable bodies, and the court holds that those properties are wanting in electricity which would be necessary to constitute it a movable object in the sense of the law. The sentence states that electricity must be regarded as one of the energies of nature, like sound, light and elasticity. It was also decided that damage to property cannot be pleaded, for that requires that the substance of the object must be affected. Again, it was held that property has been withdrawn from the wire, but the Senate denies this, for electricity is not one of the properties of copper wire, so it is unanimously concluded that the law as it is in Germany tapping an electric current is not theft.

UNIVERSITY AND EDUCATIONAL NEWS.

DR. ARTHUR TWINING HADLEY was duly inaugurated as president of Yale University on October 18th, in the presence of a distinguished audience, representing the chief universities of the United States. Dr. Hadley took the oath of office and made the inaugural address. Professor George P. Fisher, of the Divinity School, made the congratulatory address on behalf of the faculty.

COLONEL RUTHERFORD B. TROWBRIDGE has given $10,000 to the Art School of Yale University.

FUNDS are being collected for a graduate fellowship at Mt. Holyoke College in memory of Elizabeth Miller Bardwell, formerly director of the astronomical observatory.

THE committee appointed by the National Educational Association to consider the plans for a National University at Washington will meet in that city on November 2d. The committee consists of President Wm. R. Harper, Chairman, President Alderman of the University of North Carolina, President Angell of the University of Michigan, Professor Butler of Columbia University, Dr. Canfield of Columbia University, Mr. J. L. M. Curry, Washington Agent of the Peabody and Slater Funds; Superintendent Dougherty of Peoria, President Draper of the University of Illinois, President Eliot of Harvard University, Professor James of the University of Chicago, Superintendent Maxwell of New York, Professor Moses of the University of California, President Schurman of Cornell University, President Wilson of Washington and Lee University, and Superintendent Soldan of St. Louis.

COMMERCIAL education was the subject for discussion at the sessions of the International Commercial Congress on October 28th. President Low, of Columbia University, presided. Addresses were also made by President Eliot, of Harvard University, President Schurman, of Cornell University and President Harrison, of the University of Pennsylvania.

A SPECIAL committee has presented a report to the general meeting of the Convocation of the University of London. The following are among its recommendations: (1) There should be only one faculty of science with adequate representation on the Senate and the Academic Council. (2) Engineering should be a distinct branch of the one faculty of science and not a